Innovative Projects

Summer 2018

contact: innovative.projects@nokia.com

List of projects

#1	Healthiness of data
Project goals	We have nearly 100 millions data-points (time-series data) describing the telecom networks performance. We want to examine healthiness of data. For each category (performance area) and network (source) we want to calculate metrics like variance, coverage, outliers, periodicity etc.
Scope definition	Scope: • Processing provided data (reading the db dump, cleaning the data, building the data-representation, filtering etc.) • Calculating metrics (for given subset of data; done in near-real time) • Creating API for quering the data • Visualizing results
Requirements	• Programming skills in any language • Skills/knowledge/willingness to learn about data science/data processing/data analysis
Author	Mateusz Sikora, Sławomir Andrzejewski
Planned duration	1 semester
Team size	2-4

#2	Finding click-events patterns
Project goals	We would like to find and analyse the user's behavior of one of our apps. The main goal of the app is to collect, manage and share technical materials about Nokia products. Every material consist of set of different content-types (links, charts, presentations etc.) and is described by set of related metadata (creation and modification dates, related technology etc.). Users' base for this app is couple of hundreds in every week, each user performs multiple actions.
Scope definition	Scope: • Reading, cleaning and processing provided data-set(s) – Base of 'click events' (user, timestamp, event details with all related metadata) – Users' attributes: organization, position/job title • Extracting info how the users use the app: – How long spends in particular material – How many "types/classes" of users there are (and if it is somehow related to their department/job profile) – ... anything interesting, it is data mining after all • Exporting the findings in some friendly format (csv, excelc, etc) for further analysis/visualization • It should be possible to adapt the system for constant monitoring on the live app
Requirements	• Programming skills in any language (Python preferably) • Skills/knowledge/willingness to learn about data science/data processing/data analysis
Author	Sławomir Andrzejewski
Planned duration	1 semester
Team size	2-3

#3	Steal the treasure Game
Project goals	Implement real-time game with partially random map generation. As a player your goal is to steal treasure from castle and remain unnoticed by guards. As a reference see “Thief” games series.
Scope definition	Scope: • Creation of map with some random elements • Hiding mechanism (obstacles / dark spots) • Guards movement algorithm • Alternative paths from entrance to treasury • Guard elimination system
Requirements	• Basic Unity game engine knowledge (or equivalent) • Any programming language • Base algorithm knowledge
Author	Przemysław Podstawa
Planned duration	1 semester
Team size	2-4

#4	Fault handling system
Project goals	The goal of the project is to prepare a platform that will accept failure reports from one of the clients. The system should automatically parse new requests, allow them to be edited and send notifications of changes. It is also required to prepare reports and export them (CSV / Excel).
Scope definition	Scope: • Automatic data parsing (from email/file, single/multiple notification) • Adding/edit notification in UI • Report generation and export • Users management
Requirements	• Web technologies knowledge (recommended framework JHipster but we are open for others) • Any DB system knowledge
Author	Krzysztof Zieliński
Planned duration	1 semester
Team size	2-3

#5	Simple Streaming Calculation Platform
Project goals	The goal is to create platform for streaming calculation using Apache Spark, Kafka, Cassandra, Docker in microservices architecture. This platform will allow to perform Big Data Calculation in Streaming mode.
Scope definition	Features: • Storing and presenting data in NoSQL Data Base (i.e. Cassandra) • Implementation of streaming services using Apache Kafka • Deployment to Nokia Cloud with docker containers
Requirements	Scala/Java as programming language. Willing to learn new technologies. Basic knowledge about databases. Basic Knowledge of REST API.
Author	Pawel Slawski, Dawid Rutowicz
Planned duration	1 semester (even 1st iteration brings some value provided if it's done well)
Team size	3-4

#6	Projects Map
Project goals	Web Application that allows to create map of projects that are developed in given department/company. Projects should be described by: short description, technologies, list of developers etc. Each developer should be described by list of technologies/frameworks that they know - that will allow to get help in given topic by others developers.
Scope definition	Features: • Drawing map of office with projects/developers • Adding/editing projects/developers • Hierarchy view of department/company • Adding/editing department/company
Requirements	Basic knowledge about Javascript
Author	Mateusz Wierzbicki
Planned duration	1 semester
Team size	2-3

#7	Nokia integration game
Project goals	Corporation version of "Time's up" game for mobile phones with centralized DB. One part of app is web application which allow to add custom characters to game. Second part is game for mobiles. Game ask backed for random set of characters and leading 4 rounds of game (description, one word, showing without speaking and pose) - like in original "Time's up" game.
Scope definition	Web application: • List of collections • Managing user collections of characters (adding, editing, exporting, importing, tagging) • API for mobile app • Downloading random set of characters from chosen collection • Downloading random set of characters for specific characters tags (e.g. #sport, #fantasy) • Adding new tags to characters Mobile application: • Downloading characters from webapp • Showing list of characters and possibility to reject/exchange a few of them • Gameplay (4 round, 2 teams) with counting down time, points and displaying rules of each round
Requirements	• Basic of JavaScript, • Be open to learning mobile technologies like: Ionic, React Native, etc.
Author	Kamil Mleczko
Planned duration	1 semester
Team size	2-3

#8	Developers dashboard
Project goals	Application allows creating dashboards with information about important things for developers like result of builds in CIs systems. Dashboard contains tiles with results and is customizable via web interface. Sources should be connectable via plugins. Plugin is a piece of code which contains fetching data, mapping fetched data to results and presenting result on tiles. Target of the project is to run addtional computer which presents for all developers dashboard with project development status.
Scope definition	Features: • Dashboard with tiles • Configuration of dashboard via web app • Sources connectable via plugins • Notification about events (mail, slack) • Static and dynamic tiles (for example develop branch and feature builds)
Requirements	Basic knowledge about Javascript
Author	Mateusz Sikora
Planned duration	1 semester
Team size	2-4

#9	Mailing groups browser
Project goals	Application subscribes to mailing group via email (like normal user) and aggregates recived mails to threads. Threads should be searchable and filterable in the frontend part of application.
Scope definition	Features: • Mailing group client which parses mails, aggregates and persists them in DB • API for data • Client side for browsing, filtering, searching and possibility to contact with author of threads • Personalized settings for spam filters and searching
Requirements	Basic knowledge about Javascript
Author	Mateusz Sikora
Planned duration	1 semester
Team size	2-4

#10	Comparing graph databases
Project goals	Based on prepared dataset that describes relations between ancestors (family tree) you will have to present those relations in a tree form, store and transform them using graph databases: • OrientDB • HGraphDB As a conclusion you should compare those two databases based on performance and convenience for that task.
Scope definition	Following project includes:: • Storing and presenting relation data in tree form in graph databases • Scripts that perform transformations on the data, such as: – retrieve n-th ancestor/child based on relation column – filter children based on column value – get all elements with given ancestor
Requirements	• Basic knowledge about databases • Basic knowledge about data structures • Willing to learn new technologies
Author	Filip Płotnicki
Planned duration	1 semester
Team size	2-4

#11	Comparing map-reduce methods
Project goals	Based on prepared dataset that describes relations between ancestors (family tree) you will have to present those relations in a tree form and store in MongoDB. Additionally you should be able to transform them using two methods: • default map-reduce mechanism in MongoDB • Spark connector for MongoDB As a conclusion you should compare those two methods based on performance and convenience for that task.
Scope definition	Following project includes:: • Storing and presenting relation data in tree form in MongoDB • Transformations on the data using default map-reduce and Spark connector: – retrieve n-th ancestor/child based on relation column – filter children based on column value – get all elements with given ancestor
Requirements	• Basic knowledge about databases (MongoDB) • Basic knowledge about data structures • Willing to learn new technologies (Spark)
Author	Krzysztof Grining
Planned duration	1 semester
Team size	2-4

#12	Converter for table-based data to trees
Project goals	Based on prepared dataset that describes relations between ancestors (family tree) stored in a flat table you will have to prepare a "converter" that transforms the data in the flat table to a tree structure, which should be stored in Hbase. You should be able to perform transformations on the stored tree. You are free to choose or come up with a method for generating and storing the trees.
Scope definition	Following project includes:: • Converter script/application that converts flat table data into tree structured data • Script that performs transformations on the tree-structured data – retrieve n-th ancestor/child based on relation column – filter children based on column value – get all elements with given ancestor
Requirements	• Basic knowledge about distributed computing and databases • Basic knowledge about data structures • Willing to learn new technologies
Author	Filip Płotnicki
Planned duration	1 semester
Team size	2-4

#13	Recruitment application
Project goals	Mobile application on Android to support job fairs with web application for management. Tablets are taken to job fairs where candidates can fill the form for selected job offers. All the applications are presented then in web application where recuiters can see the list of candidates and contact with them via mail. List of job offers can be changed between different job fairs. Some statistics should be provided to compare job fairs and job offers interest.
Scope definition	Web application: • List of job offerts • List of applications for selected job offers • Create new events • Create new job offerts for events • Statistics (how many candidates on specific event applied on selected job offer) • Sending mails to one or more cadidates Mobile application: • Present job offers • Simple form per job offer • Work in offline mode • Send forms when online Final scope of project will be set with the team.
Requirements	• Basic knowledge about Android • Basic knowledge about Web programming • Willing to learn new technologies
Author	Ewa Kaczmarek
Planned duration	1 semester
Team size	3-4

#14	UI issue feedback
Project goals	A Chrome (web browser) extension or web application for finding and selecting those parts of web application (website) which are considered as ugly, bugged or defected.
Scope definition	Following project includes: • An extension or web application for giving feedback about unliked part of application with a visual preview (an image or live) of that part (or the entire page with those parts selected). • A control panel(also web application) where those feedbacks are stored and managed. Developing applications by group of developers comes with troubles with making an agreement of visual aspects or functionality of an app. Writing e-mails and describing something using only text consume too much time and sometimes just doesn't work, specially if one feature has more than one author. Gathering feedbacks from many sources is also hard. Project described above makes this whole process faster, easier and much cleaner, specially for someone who is responsible for fixing.
Requirements	• Basic knowledge about any web programming language (and optionally creating Chrome extensions) and any database system. • Willing to learn new technologies
Author	Maciej Bakowicz
Planned duration	1 semester
Team size	2-4

#15	Cross application notification system
Project goals	Implement platform allowing for easy management and aggregation of users notifications. Service should collect notifications from multiple applications and/or users. Platform should distribute notifications to subscribed end users. Additionally, there should be embeddable web component capable to displaying all unread user notification.
Scope definition	1. Web component should allow for: • easy embed inside external applications • display aggregated notifications • dismiss single/all notification • show details and links • manage subscribed notification sources and channels 2. Service should: • be secured source of data for web component • provide API for automatic notifications from applications • provide way to create manual notifications • allow scope notification message by type (info/warning/error), applications, topic and user/user groups • create easy way to notify end user about not read messages • allow for scale up for high-traffic
Requirements	• Any programming language • Base web technologies knowledge • Any DB system knowledge • Eager to learn new technologies
Author	Dominik Markiewicz
Planned duration	1 semester
Team size	2-6

#16	Cross-applications shortcuts as a web component
Project goals	When many web services are operated and advertised by one entity (department, company, whatever) it is wise to have consistent way to easily move user bwetween applications. Good example are Google web apps or Microsoft web apps, where it's always obvious how to jump between services in given company portfolio - by using same looking shortcuts button in every application. The goal of the project is to have web-based service that would allow for creation, maangement and display of such common component for consistent linking to many web applicati-ions/pages.
Scope definition	Minimal finished project allows for: • Separate web application where one can – create new apps - with their icons and links – order or position of particlar application on applications list • Web component in any technology, that can be embedded in navbar of any application, and when clicked will display list of applications user can jump to with clickable links/anchors. Possible extension: created app could monitor health of linked applications and disable/enable or modify view of the links displayed depending on the status of linked application (unresponsive, maintanance or similar).
Requirements	• Any programming language • Web technologies knowledge • Any DB system knowledge • Eager to learn new technologies
Author	Mateusz Wronski, Dominik Markiewicz
Planned duration	1 semester
Team size	4